



TECHNOLOGY INSIGHTS

25/01



Fig. 1: High-temperature thermal IR emitter in TO-39 package with broadband emittance in the (1...6) μm wavelength range.

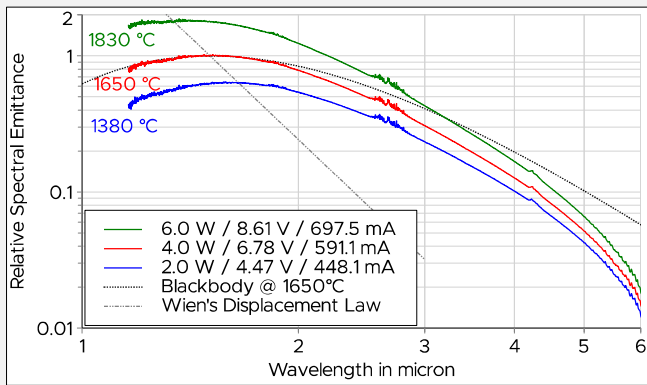


Fig. 2: Spectral emittance at different electrical input powers and operating temperatures respectively.



Fig. 3: Too hot to handle – but the emitters vaporize liquids immediately.

Too hot to handle – broadband light sources for SWIR and MWIR range

From tradition to innovation

Traditionally, high-temperature infrared (IR) emitters like the incandescent lamp use a fragile radiating element made of a coiled tungsten wire and a housing made of glass, limiting optical emittance to the short-wavelength infrared (SWIR) or near-infrared (NIR) range. However, a new generation of high-temperature thermal IR emitters (Fig. 1) using robust metal-sheet filaments and sapphire windows extend this range up to a wavelength of 6 microns, covering both SWIR and mid-wavelength infrared (MWIR) spectrums.

A new generation of high-temperature IR emitters

Our unique and patented metal-sheet filament technology (see [Insights 24/02](#)) provides a flat and free-standing IR emitter filament of high robustness and efficiency. The large light-emitting surface can be easily customized to different sizes and geometries by using standard MEMS fabrication processes. A key feature for high-temperature operation is the hermetic housing that is provided by our SOLIDSEAL® technology. Besides available standard glass packages this enables the IR emitters to be equipped with a soldered sapphire window to extend the spectral emittance to significantly higher wavelengths (Fig. 2). Sapphire's hardness and resistance to environmental factors make the emitter robust, especially in harsh conditions with low ambient pressures and temperatures.

Bring unparalleled performance to your projects

In traditional analytical applications, such as infrared spectroscopy, where optical imaging of the light-emitting surface is required, the metal-sheet filament offers a stable and reproducible filament position, eliminates the need for time-consuming lamp positioning and provides a hot spot of high optical output power to ensure reliable and highly accurate measurements.

However, the exceptional performance of this new class of IR emitters enables new possibilities in non-analytical applications, like enhanced imaging and infrared tracking, a contact-less vaporization of liquids (Fig. 3) or even a non-contact pocket lighter with the right optical focus (Fig. 1).

Experience the future of infrared technology today!

HIGHLIGHTS

- ☑ Broadband emittance in SWIR and MWIR wavelength range (up to 6 μm).
- ☑ Highest mechanical and optical stability in demanding applications with shocks and vibrations.
- ☑ Hermetically sealed package for use in harsh environments.